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Times April 27, 1939-
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Lose Strange Twin 7
To Dinosaur Fish
LONDON-The strangest true fish story in history, just un folded in South Africa, has developed one oddly conventional twist-the big one got away.
Scientists of three continents are ali egog over the catch, near the port of East London, on the southeast coast of South Africa, of a big blue fish belonging to a family supposed to have become tinct 50,000,000 years ago. In the British sclence, journal, Nature, published here, Dr. J. L. Smith of Rhodes University College, describes the five-foot, blue-scaled, archaic-styled monster. And he adds:
After careful Inspection of the mounted specimen, a responsible feitizen-angler of East London stated that about five years ago he had found precisely such a fish, only considerably larger, 1 partially decomposed, cast up by the waves on a lonely part of the shore east of East London. When he returned with assistance, the monster had vanished with a risen tide." The big one had got away.
However, Dr. Smith draws some comfort from the fact that a second fish of the same kind has been seen, even if not kept Deep-sea trawling might concelvably bring in more specimens. The one now in the East

London Museum was brought up with a haul of other fish frorg à depth of 240 feet, but it is con sidered likely that its actual habitat is deeper than that, and that it had wandered upward.
One argument for its belong. ing to deep water is found in the great size of its eyes. Fish from considerable depths are likely elther to have very large eyes, to catch what few scraps of light there may be, or else to give up the struggle altogether and get along eyeless and blind in the dark.
It is a great disappointment to scientists that owing to in- adequate facilities for preserva- tion in East London the flash and Internal organs of the "dinosaur- age" fish could not be kept. Spollage was so rapid that the carcass had to be disposed of, and only a few small parts were kept, apart from the skin which was mounted by the East London Museum taxidermist.
Dr. Smith has given the strange fish the scientific name Latimeria Chalumnae. The first or generic name is a scholarly bow to Miss Courtenay Latimer, curator of the East London Museum, who was the first scientist to examine it The

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NEW YORK POST, WEDNESDAY, MARCH 29, 2000
A FIN ROMANCE
Fantastic tale's not just →
By HALLIE LEVINE
T MAY be just a fish, but nations have fought over it, multimillion-dollar expe- ditions have been launched in search of it, and subma- rines have been hand-built to find it.
Now, in the wake of an inter-

national best seller about it, Hollywood is gearing up to make the movie.
No, this is not another Jaws, Moby Dick or even (Free) Willy. All this fuss is for the coelacanth
pronounced see-la-kantha rather strange, steel-blue, 5-foot-long fish that swims in the Indian and Pacific oceans.
You can't eat it because it will give you really bad diarrhea. But if you catch one, it's good for you - you're worth a fortune. On the other hand, the fish - used to cold temperatures dies almost immediately.
So, just what is it about the coelacanth that's hooking all this attention?
"I think there is just something totally fascinating about it," gushes Samantha Weinberg, a British writer whose book about the hunt for the coelacanth, "A Fish Caught in Time" (HarperCollins), has become an international best seller. It hits U.S. bookshelves next month.
The fish is 400 million years old older than the dinosaurs. It was believed to be extinct until 60 years ago, when it was rediscovered in the net of an unsuspecting fisherman off the South African coast.
Amazingly, it's also our great uncle 40 million times removed eshy, limb-like fins indi-
the
any old fish story
SEA-ING IS BELIEVING: A diver swims with a coelacanth (pronounced see-la-kanth), a 400-million-year-old fish that was fascinating folks back in 1939, when London's Easter Province Herald ran this headline (top inset), and that today is the darling of the publishing and movie industries.
HarperCollins
million years, separate from all
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THE OUTBOARDDELD
A LIVING FOSSIL
CAUGHT IN
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BEST FISH STORY IN
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Scientific Disroreries
Of The Century
EAST LONDON'S BONDER
SPECIMEN TRAVLED
international
aquariums eager
to find a coela-
canth descended on

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first fish to crawl from the sea
and evolve into a reptile. In fact,
there's even one at the American
Museum of Natural History.
"There is definitely something
very wonderful about a creature
that has quietly existed for 400
the turmoil going on above it on
land," says Susan Jewett, an ich-
thyologist (fish expert) at the
Smithsonian Institution.
One thing is clear: Everyone
who researches this fish becomes
obsessed by it.
-reve
HOOKED: Samantha Weinberg, author of "A Fish Caught in Time," calls the coelacanth "totally fascinating."
Mark Fletcher
Courtenay-Latimer, curator of a
small South African museum,
who spotted the strange-looking
creature in a local fisherman's
net just before Christmas 1938.
Courtenay-Latimer called in
J.L.B. Smith, a South African
fish expert. He ran a poster cam-
paign along the East African
coast, promising a fortune to the
fisherman who found a living co-
elacanth.
When word got out in 1952
that one had turned up in the
Comoro Islands - a series of
French-governed islands off of

East Africa - Smith persuaded the South African government to fly him out to inspect it.
He sparked an international outrage when he whisked the critter off to a Cape Town museum - prompting the French to ban all other scientists from the islands.
When the Comoros became independent and lifted the ban in 1975, German scientist Hans Fricke led the new coelacanth charge. He was so determined to find a live specimen that, in 1989, he built a special submarine to go deep into uncharted waters.
He never caught a live coelacanth, but got many of them on film, recording the nighttime browsing of the fish as they searched for food.
Researchers suspected that less than 300 coelacanths, remained
Comoros, and
Fricke spearheaded efforts to save the fish.
listed as endangered by the Convention on International Trade in Endangered Species.
Then, an American scientist recently discovered the fish had other stomping grounds besides the east coast of Africa.
The scientist, Mark Erdmann, was on honeymoon in Indonesia in 1997 when he spotted a large fish being wheeled along on a hand cart. He recognized it immediately as a coelacanth.
Erdmann soon began interviewing fishermen on the Indonesian island about the fish. On July 31, 1998, a fisherman brought him to a live coelacanth.
"The moment I looked at it, I felt this amazing bond with it," recalls Weinberg, who flew to Indonesia after Erdmann's discovery.

"It had this smooth skin and these
amazing, shimmering,
opaque eyes. When I stroked it,
some of the scales fell off in my
hand I still carry them around
with me in a sunglass case."
Soon after, camera crews and
the islands.
But Erdmann worked tirelessly
to safeguard the fish convinc-
ing the natives to make money
selling coelacanth souvenirs, in-
stead of trying to catch the fish.
Despite, the hubbub surround-
ing the weird-looking fish, it's
not on the treasured-creatures
list of the woman who "discov-
ered" it.
"I've been pestered and pes-
tered about that coelacanth,"
grumbled 92-year-old Marjorie
Courtenay-Latimer when con-
tacted by The Post.
"I've been in existence for al-
most as long as that fish, and
I'm just tired of people calling
me up when I'm practically in
bed to comment on it," she said.
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Before hanging up, she added
grumpily: "The coelacanth. The
coelacanth. Enough of the coela- 3)
canth!"
"The moment I looked at [the
coelacanth] I felt this amazing bond
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SAMANTHA WEINBERG, AUTHOR
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25 SEPT. 98.

Rare 'living fossil' fish found near Indonesia
BERKELEY, Calif. - A biologist has found a second population of a rare, primitive fish whose origins date to the dinosaur era.
The so-called "living fossil" known as a coelacanth was found in July in waters off Indonesia. The only other place the fish are known to exist is in a small area around the Comoros Islands off the coast of Africa.
That discovery, made in 1938, ignited worldwide interest because it disproved theories that the species became extinct about 65 million years ago.
"Indonesia is so far from the Comoros that this must really be another population of the animals," Dr. Sante Paablo, a molecular biologist at the University of Munich, said in Thursday's New York Times.
The coelacanth are generally about 5 feet long with paddlelike tails and can weigh more than 60 pounds.
The July find was reported Thursday in the journal Nature with a brief letter by the discoverer, Mark Erdmann, a University of California, Berkeley postdoctoral fellow. (AP)

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THE BOSTON GLOBE MONDAY, OCTOBER 19, 1987 51
SCIENCE MUSINGS/CHET RAYMO
Let us consider now
the coelacanth
"Consider now the Coelacanth,
Our only living fossil,
Persistent as the amaranth,
And status quo apostle.
L
eave it to Ogden Nash, that master of whimsical verse, to find the perfect rhyme for coelacanth. The amaranth is the flower of poetic fame that never fades. And the coelacanth (pronounced see-la-canth) is the fish that never fades. Once thought to have been extinct for eons, it was all the while holing up in the depths of the Indian Ocean, quietly maintaining its unique and amaranthine status quo.
For years the coelacanth was known to science only as a fossil in very ancient rocks. It is a member of a lobe-finned family of fishes that flourished at the time when fins and gills were evolving into feet and lungs. Some of the coelacanthic tribe flip-flopped onto the shore, took a gulp of air, and eventually transformed themselves into the higher animals, including ourselves.
Other coelacanths stayed in the sea and became extinct. The last of their kind show up as fossils in rocks that are 70 million years old.
Or so it was thought.
Then, in 1938, a fisherman snared a coelacanth in the waters of the Indian Ocean off the coast of Africa. This unattractive, mucus-covered, bug-eyed beast, who may have been our ancestor, is not extinct after all. It has maintained itself essentially unchanged in the murky depths of the sea. It is a "fossil"

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from the past, mysteriously but most assuredly alive.
Upon discovery, the coelacanth became an instant celebrity, but apparently it has no taste for the limelight. A second specimen was not recovered until 1952. The fish has remained grandly elusive. It may instinctively know that the only way to survive for 70 million years is to lie low and keep out of trouble. After all, look what happened to the coelacanth's terrestrial neighbor, the dodo of Madagascar. Discovered by Europeans in 1507, it was gone a few centuries later. Fame was the dodo's fatal misfortune.
In spite of (or perhaps because of its natural reticence, the coelacanth has been relentlessly pursued. The first observations of a living coelacanth were reported in 1955 by Jacques Millot, the director of the Madagascar Institute of Scientific Research. Millot's coelacanth was caught on a line and released alive into a tank. The bottom-loving creature with phosphorescent eyes was much distressed to find itself in sunlight. It sought out the darkest corners of the tank. Within hours it had turned belly-up and was making agonized movements with its gill-covers and fins. Its death throes were carefully observed by a crowd of enthusiastic admirers.
The coelacanth was first photographed in its natural habitat by the French diver Jacques Stevens in 1966. Stevens encountered a coelacanth 130 feet under the sea, and set off his flash-gun right into the startled fish's gaping eyes. The highly unflattering color photo soon appeared as a two-page spread in Life magazine. Said Stevens: "Although fierce-looking, my coelacanth was not agressive; it just seemed anxious to escape.
And no wonder. In a recent issue of Nature comes a report of extensive observations of coelacanths at home on the bottom of the sea. A group of German scientists tracked the fish to its lair, 300 feet under the surface, using a research submarine equipped with movie cameras. The site was near the remote volcanic islands of the Comores in the Western Indian Ocean.
On their own "turf," the coelacanths lead a low-key lifestyle that is well-suited to a creature that has been out of touch with progress for 70 million years. It drifts up, and drifts down, on rising and falling currents. It lolls, it dawdles. It sluggishly swims, sometimes forward, sometimes backward, sometimes upside-down. It stands yoga-like on its head, for no apparent reason at all. Only four times in 496 minutes of observations did the Germans record anything resembling a fast start.
Give the last word on the coelacanth to Ogden Nash:
"It jeers at fish unfossilized
intellectual snobs elite;
Old Coelacanth, so unrevised
It doesn't know it's obsolete.
Chet Raymo is a professor of physics at Stonehill College and author of several books on science.

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Living Fossil

Glimpses of a coelacanth

or years, British Cameraman Peter Scoones has had an unlikely dream. dedicated scuba diver, he wanted to photograph a live coelacanth (pronounced seal-ah-kanth), the ancient, almost legendary, stump-legged fish which once was believed to have died out soon fter the dinosaurs. Now this paparazzo of ne deep has nailed his prey. Last week Scoones released rare color photographs one of these "living fossils," swimming ontentedly for his camera in the Indian cean off the Comoro Islands near the alagasy Republic.

On assignment for the BBC, Scoones ed his search by dragging an under- er television camera along the seabed depths of about 300 meters (1,000 ft.) off Comoros. On board his small boat, he rently watched the TV monitor for a mpse of the fish that had only been wn from the earth's fossil record until e accidental discovery of a living specmen by a British biologist some 40 years

E. FEBRUARY 26, 1979

ago. Since then, fishermen have caught two dozen more live coelacanths in their nets. Unfortunately, the creatures, which grow to about 1.5 meters (5 ft.), weigh about 70 kg (150 lbs.) and possess four large fins apparently the evolutionary beginnings of limbs-usually were dead by the time they reached scientists.

Scoones was not even as lucky as the fishermen. A week into the hunt, the cable to his camera snagged and broke, the equipment was lost, and his frustrated TV. crew promptly returned to England. Only a few days later a volcano erupted on Great Comoro. With lava flowing toward the sea, frantic natives commandeered Scoones' boat as an emergency vessel. Next morning, a disappointed and- weary Scoones was shaken out of bed by an excited islander. A full-grown coelacanth had been caught, he was told. It was still alive, lashed under a fisherman's ca-

noe. With only a mask and snorkel,
Scoones ventured underwater to free his
battle-fatigued quarry, then nudged the
fish into a current. That was enough to re-
vive the coelacanth for the camera. Pic-
tures taken, Scoones returned the big
catch to the natives-for sale, of course,
to scientists.
Caught by Comoro fishermen, the shy coelacanth makes a live appearance for the camera
CR: LARRY ARNOLD, PSI
-SEAPHOT/COLORIFI
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Do Scientists Pose a Threat to Rare 'Fossil Fish'?
Hans Rauchensteiner
Hans Fricke of West Germany, who opposes capture, with photo of live coelacanth.
Experts debate the
wisdom of capturing
a live coelacanth.
By MALCOLM W: BROWNE
T
HE Coelacanth, a rare fish-
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Apprehension about the survival of
the few coelacanths known to exist
has been kindled in part by the efforts
of at least one aquarium to capture a
live coelacanth. The possibility of
keeping a coelacanth in an aquarium
tank is nearly as intriguing to some
naturalists as the dream of caging a
live dinosaur.
Experts say that the scientific
quest for coelacanths- dead or alive
- has created a black market for the
fish. The demand is supplied by com-
mercial fishermen who occasionally
bring up a coelacanth (pronounced
SEE-la-kanth). from the cold, deep
water surrounding the island nation
of Comoros in the Indian Ocean.
Until 1938, when a fisherman
caught the first known living cuela:
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lieved to have died out 90 million

years ago. Coelacanths are abundant in the fossil record, but even since 1938, only a few dozen have been caught, all by commercial fishermen. The traumatized fish have never survived more than a day or two, and their carcasses have been. generally frozen and sold by Comoros business-men to foreign scientists for dissec. tion and study. The official, Govern-ment bounty offered to fishermen who bring in coelacanths is $200, but scientists say that a lucrative trade in dead coelacanth's is also conducted by private Comoran entrepreneurs.
Coelacanths are large predators with formidable teeth and strong Jaws Naturalists can only guess how many of these Mesozoic-éra crea-tures may still exist IT is not even known whether any live outside the. small region of the Indian Ocean where all known specimens have been caught
Four of the coelacanth's fins, unlike these of most other fish, have bones and joints suggestive of primitive legs Some scientists therefore be lieve that close relatives of modern coelacanths may have evolved some 350.million years ago into the first land-dwelling amphibians, and thus were ancestral to all land verte-brates, including man. Other scien-tists, however, believe that lung fish founded the land vertebrate line.
The current scientific interest in coelacanths was prompted in part by a report last September-that-West
Continued on Page C

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Are Scientists a Threat to Rare Fossil Fish?
Continued From Page CJ-
Looking for Adventure, Excitement, Discovery?
Join Expedition Seeking Ancient Coelacanth
German scientists had used a small. submarine to film coelacanths In their natural habitat off the Comoros islands. The German group, led by

Dr. Hans Fricke of the Max Planck .Institute for Comparative Physiology In Seewiesen, succeeded for the first time in photographing the pecultar movements and feeding hablis of the Headline of five-foot fish at the bottom of the ocean. Coelacanths sometimes per-form-headstands_or_swim upsida. -down-as-they-toll-along-the-ocean-floor.

Subsequently, the New York Ex-plorers Club, the New York Aquar-lum and a consortium of academic in-stitutions organized an effort to cap-ture and transport a live-coelacanth. to an aquarium, or, failing that, to ac-quire dead specimens for dissection. The organizers published an invita-tion to volunteers willing to pay $4,000- In costs to Join a coelacanth expedi-tion.

A nine-member delegation, includ-ing two paying volunteers, went to the Comoros last November in search of coelacanths. The group caught no live animals but acquired two frozen specimens from sources that scien-tists declined to identify. A weeklong post-mortem examination of the two fish was conducted in January at the Virginia Institute of Marine Science by about 30 scientists from 10 univer-sities.

Clarifying Role In Evolution

From computed tomography (CT) scans, microphotographs of tissue cells and analysis of DNA collected in the post-mortem, the team hopes to clarify the role the coelacanth may have played in the evolution of land animals

Louis E. Garibaldi, acting director of the New York Aquartum and a leader of the campaign to capture a coelacanth, said in an interview that his group had established a network of contacts among fishermen and others in the Comoros, so that if a coelacanth was captured alive it could be protected and swiftly moved to an aquarium.

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Decision Against Capture=
"Of the six coelacanths we studied. we could easily have taken one on board," Dr. Fricke said. "But I decided not to do it, because it would have led to more problems for these' animals. Later 1 conferred with the director of the Wilhelma Aquarium In Stuttgart, one of our backers, who had naturally been eager to get a coelacanth. But despite that, he absolutely supported my decision not to bring. one back.'
and that would otherwise be eaten.
"We are just as interested as Dr. Fricke-in-safeguarding-the-coola canths," he said. "Heis entitled to his opinion that these animats cannot be kept alive in captivity, but we believe otherwise.Many animals that are extremely sensitive to changes In habl-. lat have been kept alive."
Having coelacanths living in captivity would not only permit scientists to study the fish and its role in evolution, Mr. Garibaldi said, but might also help to save the species, He said coelacanths might be facing extinction, and suggested that breeding the fish in an aquarium might stave off the end.
"Moreover, as Dr. Fricke has pointed out," he said, the German group has the means to capture one safely. We have the means to transport it safely. I would welcome coop eration with Dr. Fricke's group."
Dr. Fricke, Who vehemently rejects the Idea, plans another submarine photographic expedition to the coela-
"Some of these churches contain silver votive artifacts in the form of fishes," he said. "The curious thing about these fishes is that they are clearly representations of coelacanths but not the Latimeria chalumnso-ecolacanths-we-find-eff the Comoros. These works of art are carefully detailed and I am convinced they depict a completely different type of coelacanth, one perhaps

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Dr. Fricke, whose submarine Geo conducted the filming of the coelacanth, strongly opposes the initiative. "It's outrageous," he said in an interview. "In the first place, I don't believe it is possible to keep one of these animals alive in captivity, after the trauma it undergoes being caught at a great depth, being rapidly depressurized and then being exposed to warm surface water that disrupts its

mechanism for absorbing oxygen."
"More important," he added, "if a coelacanth ever should reach an aquarium alive, other aquariums will try to get their own specimens, and these fish are not numerous enough to survive the toll that would be taken.
Hans Fricke, who opposes such expeditions, and an assistant, photographing dead coelacanths.
Already we see the Comoro fishermen responding to the economic incentives scientists have created. They are changing their techniques, consciously trying to catch more
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catches. For one thing, they're using much heavier lines than in the past, to hold the big coelacanths when they hook them."
Dr. Fricke said he easily could have captured coelacanths and maintained them under pressure in his own submarine.
"We discovered how to attract these animals by passing a weak electric current through the water outside the submarine," he said. The coelacanth, in common with sharks and some other marine predators, apparently finds and tracks prey by sensing the faint electrical signals emitted by fish.
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who bring in coelacanths is $200, but

scientists say that a lucrative trade in dead coelacanths is also conducted by . private Comoran entrepreneurs.
Coelacanths are large predators with formidable teeth and strong jaws. Naturalists can only guess how many of these Mesozoic-era creatures may still exist. It is not even known whether any live outside the small region of the Indian Ocean where all known specimens have been caught.
Four of the coelacanth's fins, unlike those of most other fish, have bones and joints suggestive of primitive legs. Some scientists therefore believe that close relatives of modern coelacanths may have evolved some 350 million years ago into the first land-dwelling amphibians, and thus were ancestral to all land vertebrates, including man. Other scien-
Continued on Page C8
Hans Fricke, West German scientist, with photograph of live coelacanth.

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In the New York group. Page A
come on rage A17, Column 1
Continued on Page A22, Column 1
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Photos of Rare Fish May Be Clue to Evolution

By MALCOLM W. BROWNE

Primitive fish once believed to have died out long before the demise of the dinosaurs have been photographed in their deep ocean habitat for the first time.
The strange movements of these coelacanths, survivors of a biologically ancient line, surprised and delighted the scientists who ventured into their habitat in a research submarine. Scien
el, tists believe that analysis of the pic
ti-tures may shed light on the aquatic an-
nt cestry of all land vertebrates, including of humans.
at
The pictures, which clude still

m photographs, movies and videotape,
were taken by a West German team
ed using a miniature submarine in the
1-western Indian Ocean near the Como
erros Islands. They show the bizarre
se five-foot creatures performing ócca-
'st sional headstands, swimming belly up
se and sometimes swimming backward, A coelacanth, about 5 feet long, photographed in Indian Ocean.
id among other unusual behavior.
Beginnings of Legs
INSIDE
Dr. Hans Fricke and his colleagues
of from the Max Planck Institute for
F. Comparative Physiology and the Uni-
e-versity of the Saarland recorded the
on pecullar swimming and maneuvering
ry of six of the animals in eight hours of
observations. The findings are re-publisher. Page DI,
ith ported in this week's issue of Nature, a
ith British scientific journal
Ms. Magazine Is Sold
An agreement in principle has been
reached to sell the feminist monthly
to John Fairfax Ltd., the Australian
■e-
Coelacanths, are members of a
larger group of primitive fishes, cros-
no sopterigians, which many zoologists
ost believe are an important evolutionary
the link between aquatic and terrestrial
ike vertebrates. Of the eight fins on these
ple fish, four are paired and have bone
structures that may represent the
up beginning of a transition to the legs of
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Prices Up in New York Area
The Consumer Price Index for New
York and northeastern New Jersey
soared in August at nearly twice the
national rate. Page D1.
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NY Times. Sept 24, 1987 - page one
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First Deep-Sea Photos of Rare Fish May Be Clue to Evolution
Continued From Page AI
land animals. The extinct rhipidistian
fishes, also members of the crossop-
terygian line and close cousins of coela-
canths, are widely regarded as ances-
tors of the amphiblans, from which all

other four-footed land animals are believed to have evolved.

Fossils of crossopterigians have long been known to paleontologists. Judging from the fossil record, coelacanths and other crossopterigians first appeared in the Devonian period 350 million years ago, and they evolved into an extremely successful line. The coelacanths' formidable teeth made them effective predators. But the fossil record suggested that crossopterigians became extinct around 90 million years ago, some 25 million years before the disappearance of dinosaurs.

Strange Catch Off Africa

In 1938, however, a fisherman near the southern coast of Africa netted a strange fish, the remains of which reached a biologist. He identified the animal as a coelacanth.

The discovery was a sensation, and scientists offered rewards to fishermen for more "living fossils," as the creatures were dubbed. In 1952 a second specimen turned up, and since then, a few more coelacanths have been found in the Indian Ocean, some of which were captured alive.

But despite many efforts, scientists have never succeeded in fully reviving the traumatized coelacanths brought up hundreds of feet to the surface, and live specimens have always died within day or two of capture. This has prevented paleontologists and anatomists from studying the natural movements

ple fish, four are paired and have bone structures that may represent the

up beginning of a transition to the legs of

Continued on Page A16, Column 1

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The New York Times/Sept 24, 1987
Primitive fish were photographed
near the Comoros Islands.
of healthy coelacanths. Such observations were regarded as important in finding possible traces of the animals' preadaptation to crawling on land.
Despite the extreme rarity of living coelacanths, Dr. Fricke's group says in its Nature report that the scientists found no fewer than six of the fish at depths from 380 to 600 feet. Although they proved to be nocturnal, the animals did not seem disturbed by the bright lights of the manned submarine Geo.
Puzzling Movements
The behavior of the fish was sometimes puzzling. All the coelacanths occasionally performed a kind of head
lasting up to two minutes. Some
they swam with their bellies up,
metimes they swam backwards.
For the most part, the fish maneuvered sluggishly, merely coasting in the upwelling or downwelling of ocean currents. Occasionally they would dart forward, their main thrust coming from their large, paddle-like tail fins.
cursors of land vertebrates. The lungfish, which can absorb oxygen from the air as well as from water, is also a possibility.
"Many would say that the lungfish
are closer to land tetrapods," he said,
But of greatest Interest to the scien- "although there are far more crostists was the peculiar synchronous pat- sopteriogians in the fossil record. The

tern of movement of the creatures' crossopterigians reached their high
paired fins that was likened to the point at the end of the Triassic period,"
movements of four-legged animals. 195 million years ago, "and then de-
This pattern, they said, "is common to clined sharply"
tetrapod locomotion," but is extremely "By the Cretaceous period," he said,
rare in fish, other than in a few bottom-referring to the heyday of the dino-
dwelling species.
saurs, which ended 65 million years
Two coelacanths were observed rest- ago, "the crossopterigians were al-
ing on the ocean bottom, and they did ready very much reduced in num-
not use their paired fins to crawl. But bers.'
the synchronous movements of these
limb-like fins seemed to help stabilize
the cigar-shaped bodies of the fish.
"Such coordination," they suggested,
"could indicate another preadaptation
in the crossopterygian group that could
have facilitated the transition to loco-
motion on land."
The evolutionary role of the crossopt-
erigians remains a subject of debate, to
which the film produced by the Ger
man expedition is likely to add fuel.
Possible Evidence of Link
Dr. John G. Maisey, associate cura-
tor of vertebrate paleontology at the
American Museum of Natural History
in New York, believes the German film
may offer important new evidence
Dr. Gary Nelson, curator of Ichthi-
ology at the same museum, believes
the German expedition may have
opened a new line of inquiry. "These
coelacanths," he said, "were found at
much shallower depths than had been
regarded as normal for the animal.
The investigators actually saw six of
them during their observations. This
suggests that living coelacanths may
be more plentiful and accessible than
anyone had suspected. We may even
see a coelacanth in an aquarium one
day.'
Dr Maisey believes it is possible that
other supposedly extinct animals may
have survived in remote ocean habi-
tats. "I'm not speaking of the Loch
Ness monster or of claimed sightings
The coelacanths photographed by the of living plesiosaurs," he said, "but
expedition "are very similar to extinct somewhere, there may have survived a
lines of crossopterigians, and their handful of supposedly extinct species
movements may therefore reveal of great interest to science. Surprises

evolutionary clues," he said. "The manner in which they open and shut their mouths, use their gills, pass water over their pharynxes and so forth, can tell us a great deal about their evolutionary relationship to land-dwelling tetrapods. Vertebrate paleontologists are most anxious to see this film.
Dr. Malsey noted that crossopteri-| glans are not the only candidate as pre-
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Negotiators for National Football League owners and the striking players met in Philadelphia in an effort to settle the walkout. Page B7.
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are still possible.
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Are Scientists a Threat to Rare 'Fossil Fish"?
Continued From Page Cl
tists, however, believe that lung fish

founded the land vertebrate line.

German Film Expedition

The current scientific interest in coelacanths was prompted in part by a report last September that West German scientists had used a small submarine to film coelacanths in

Looking for Adventure, Excitement, Discovery?
Join Expedition Seeking Ancient Coelacanth
The International Angler

their natural habitat off the Comoros Headline of notice recruiting volunteers willing to pay to join an expedition to capture a coelacanth.

islands. The German group, led by Dr. Hans Fricke of the Max Planck Institute for Comparative Physiology in Seewiesen, succeeded for the first time in photographing the peculiar movements and feeding habits of the five-foot fish at the bottom of the ocean. Coelacanths sometimes perform headstands or swim upside down as they loll along the ocean floor.

Subsequently, the New York Explorers Club, the New York Aquarjum and a consortium of academic institutions organized an effort to capture and transport a live coelacanth to an aquarium, or, failing that, to acquire dead specimens for dissection. The organizers published an invitation to volunteers willing to pay $4,000 in costs to join a coelacanth expedition.

A nine-member delegation, including two paying volunteers, went to the Comoros last November in search of coelacanths. The group caught no live animals but acquired two frozen specimens from sources that scientists declined to identify. A weeklong post-mortem examination of the two fish was conducted in January at the Virginia Institute of Marine Science by about 30 scientists from 10 universities.

Clarifying Role in Evolution

From computed tomography (CT) scans, microphotographs of tissue cells and analysis of DNA collected in the post-mortem, the team hopes to clarify the role the coelacanth may

have played in the evolution of land
animals.
Louis E. Garibaldi, acting director
of the New York Aquarium and a
leader of the campaign to capture a
coelacanth, said in an interview that
his group had established a network
of contacts among fishermen and
others in the Comoros, so that if a
coelacanth was captured alive it
Hans Fricke, who opposes such expeditions, and an assistant, photographing dead coelacanths.
Already we see the Comoro fisher:
men responding to the economic in-
centives scientists have created.
They are changing their techniques,
consciously trying to catch more
coelacanths, along with their regular
catches. For one thing, they're using
much heavier lines than in the past, to
hold the big coelacanths when they
hook them."
Dr. Fricke said he easily could have
Hans Rauchensteiner
Breeding coelacanths eration wick, who vehemently re
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some assert.
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churches.
"Some of these churches contain
cilver vative artifacts in the form of

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Do Scientists Pose a Threat to Rare Fossil Fish??
Hans Rauchensteiner
Hans Fricke of West Germany, who opposes capture, with photo of live coelacanth.
Experts debate the
wisdom of capturing
a live coelacanth.
By MALCOLM W. BROWNE.
HE coelacanth, a rare fish
that until 1938 was known
only through its fossils, has
become the target of collect-

ing expeditions that some scientists fear could lead to the fish's extinction.

Apprehension about the survival of the few coelacanths known to exist has been kindled in part by the efforts of at least one aquarium to capture a live coelacanth. The possibility of keeping a coelacanth in an aquarium tank is nearly as intriguing to some naturalists as the dream of caging a live dinosaur.

Experts say that the scientific quest for coelacanths- dead or alive - has created a black market for the fish. The demand is supplied by commercial fishermen who occasionally bring up a coelacanth (pronounced SEE-la-kanth) from the cold, deep water surrounding the island nation of Comoros in the Indian Ocean.

Until 1938, when a fisherman caught the first known living coelacanth, this group of fishes was believed to have died out 90 million years ago. Coelacanths are abundant in the fossil record, but even since 1938, only a few dozen have been caught, all by commercial fishermen. The traumatized fish have never survived more than a day or two, and their carcasses have been 'generally frozen and sold by Comoros businessmen to foreign scientists for dissection and study. The official Government bounty offered to fishermen who bring in coelacanths is $200, but scientists say that a lucrative trade in dead coelacanths is also conducted by private Comoran entrepreneurs.

Coelacanths are large predators with formidable teeth and strong. jaws. Naturalists can only guess how many of these Mesozoic-era creatures may still exist. It is not even known whether any live outside the small region of the Indian Ocean where all known specimens have been caught.

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Are Scientists a Threat to Rare 'Fossil Fish?
Continued From Page Cl
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Subsequently, the New York Explorers Club, the New York Aquarium and a consortium of academic institutions organized an effort to capture and transport a live coelacanth to an aquarium, or, failing that, to acquire dead specimens for dissection. The organizers published an invitation to volunteers willing to pay $4,000 in costs to join a coelacanth expedition
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Clarifying Role in Evolution

From computed tomography (CT) scans, microphotographs of tissue cells and analysis of DNA collected in the post-mortem, the team. hopes to clarify the role the coelacanth may have played in the evolution of land animals.

Louis E. Garibaldi, acting director of the New York Aquarium and a leader of the campaign to capture a coelacanth, said in an interview that his group had established a network of contacts among fishermen and others in the Comoros, so that if a coelacanth was captured alive it could be protected and swiftly moved to an aquarium.

Dr. Fricke, whose submarine Geo conducted the filming of the coelacanth, strongly opposes the initiative "It's outrageous," he said in an interview "In the first place, I don't believe it is possible to keep one of these animals alive in captivity, after the trauma it undergoes being caught at a great depth, being rapidly depressurized and then being exposed to warm surface water that disrupts its mechanism for absorbing oxygen."

"More important," he added, "if a coelacanth ever should reach an aquarium alive, other aquariums will try to get their own specimens, and these fish are not numerous enough to survive the toll that would be taken.

Already we see the Comoro fishermen responding to the economic incentives scientists have created They are changing their techniques, consciously trying to catch more coelacanths, along with their regular

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Headline of notice recruiting volunteers willing to pay to join an expedition to capture a coelacanth.
Hans Fricke, who opposes such expeditions, and an assistant, photographing dead coelacanths.
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much heavier lines than in the past, to
hold the big coelacanths when they
hook them.
Dr. Fricke said he easily could have
in captivity might
captured coelacanths and maintained help save the species,
them under pressure in his own sub-
marine
"We discovered how to attract
these animals by passing a weak elec-
tric current through the water out-
side the submarine," he said The
coelacanth, in common with sharks
and some other marine predators, ap-
parently finds and tracks prey by
sensing the faint electrical signals
emitted by fish.
Decision Against Capture
"Of the six coelacanths we studied,
we could easily have taken one on
board," Dr. Fricke said. "But I de-
cided not to do it, because it would
have led to more problems for these
animals. Later I conferred with the
director of the Wilhelma Aquarium in
Stuttgart, one of our backers, who had
naturally been eager to get a coela-
canth. But despite that, he absolutely
supported my decision not to bring
one back."
Rid your home or plant of pests and varmints with
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some assert.
In response, Mr. Garibaldi con-
tended that his group was merely
seeking to save some of the coela-
canths that are hooked by fishermen
and that would otherwise be eaten
"We are just as interested as Dr.
Fricke in safeguarding the coela-
canths," he said. "He is entitled to his
opinion that these animals cannot be
kept alive in captivity, but we believe
otherwise. Many animals that are ex-
tremely sensitive to changes in habi-
tat have been kept alive.
Having coelacanths living in cap-
tivity would not only permit scientists

to study the fish and its role in evolution, Mr. Garibaldi said, but might also help to save the species. He said coelacanths might be facing extinction, and suggested that breeding the fish in an aquarium might stave off the end

"Moreover, as Dr. Fricke has pointed out," he said, "the German group has the means to capture one safely. We have the means to transport it safely I would welcome cooperation with Dr. Fricke's group."

Dr. Fricke, who vehemently rejects the idea, plans another submarine photographic expedition to the coela-

Hans Rauchensteiner"

canth's domain in June, supported in 1 part by the National Geographic Society. Meanwhile, he is pursuing another line of research based on clues. found in 19th century Spanish: churches.

"Some of these churches contain silver votive artifacts in the form of fishes," he said. "The curious thing. about these fishes is that they are. clearly representations of coelacanths but not the Latimeria. chalumnae coelacanths we find off the Comoros. These works of art are carefully detailed and I am convinced they depict a completely different- type of coelacanth, one perhaps) smaller than Latimeria, that might have lived until recently in the Atlantic or Mediterranean. The question, of course, is whether any might still be ' alive."

ANTHONY
JEWIS

Sundays and Thursdays on
the Op-Ed page

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SPECIAL FOR THIS WEEK

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THE NEW YORK TIMES INTERNATIONAL THURSDAY, OCTOBER 30, 1997
Hantsmbou Journal

It's No Fish Story: There's a Dinosaur Down There

By SUZANNE DALEY

HANTSMBOU, Comoros - In this tiny fishing village, a place where the black lava rock coastline gives way to a small stretch of white sandy beach, Otsambu Chindini is something of a celebrity.

Three years ago, in his 27th year as a fisherman, he caught one of the world's rarest fish- a 157-pound coelacanth, a fish with leglike fins that scientists call a living fossil.

The species was assumed to have become extinct with the dinosaur about 70 million years ago. Then in 1938, one was hauled up in a net off the coast of South Africa.

Since then, fewer than 200 have been caught virtually all of them in the deep waters off Grande Comore island and off Anjouan, a neighboring island in the Comoran archipelago. Some scientists estimate that there may be no more than 500 coelacanths (pronounced SEE-luh-kanths) still in existence.

Part of Mr. Chindini's celebrity certainly comes from the catch-no one else in his village has caught one of the five-foot-long metallic blue fish with white spots.

But the other part of his fame, judging from the grins of his fellow fishermen, is that he did not recognize that he had a coelacanth and bludgeoned it to death. Mr. Chindini, who lives with his wife and seven children in a one-room house shaded by palm trees, grins about this too.

But he is willing to tell the story: how, as he was hoping for tuna or oilfish, he sandwiched the bait between two stones so it would sink far below the surface, and how because of a special loop he could release the stones with a small flick of the wrist,

leaving the white bait exposed to
catch any glimmer of light to be
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Pictures by João Silva/Sygma, for The New York Times
The coelacanth, above, a primitive fish once thought to have become extinct with the dinosaur 70 million years ago, is occasionally caught in the deep waters off the Comoros Islands in the Indian Ocean by fishermen using dugout canoes. Otsambu Chindini, top left, of Hantsmbou, a tiny village on Grande Comore Island, hooked one three years ago and, unaware of its value, smashed its head in. Some scientists estimate that there may be no more than 500 coelacanths still in existence.

[PAGE BREAK]

found 840 yards below the surface,
and how suddenly his line was very
heavy.
"I pulled very carefully," Mr.
Chindini said, pantomiming the motions. He does not mind showing off
the line he used either. It looks like a
large ball of knitting wool. Fishing is
strictly by hand here.
At first Mr. Chindini was simply
disappointed by his catch. But when
he got back to the village, and
learned its value, he wished he had
not been so quick to bash in its skull.
Still, he got $217 for it from the former director of the island's fishing
institute a fortune for Mr. Chindini, who like most of the other fishermen on this remote Indian Ocean
island barely ekes out a living.
The truth is, no coelacanth are liv-

ing in captivity. They are slow-mov-
ing creatures that live at great
depths. They absorb oxygen badly
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The New York TIMES
and there is less in the warm surface
water than down at the depths where
they live, so the fight to the surface,
and the rapid decompression, leaves
them so drained that they usually die
in a day or two.
In 1938, the discovery of the coel-
acanth sent fish experts aflutter.
Some believed that the modern coel-

acanth is a close relative of the line of fishes that gave rise to the first vertebrates to walk on land.
Fossils show that the fish once existed in great abundance.
But the fishermen of the Comoros mostly consider the coelacanth a nuisance. They are not particularly good to eat. They have value only when foreigners come around asking. In 1994, the Comoran Government signed an international treaty agreeing not to trade in coelacanths.
3d Priest Is Killed in India
NEW DELHI, Oct. 29 (AP) - A Catholic priest was found beheaded in a forest in northern India, apparently killed for helping untouchables, colleagues said today.
A search party from the Australian-run mission that employed the priest, the Rev. A. T. Thomas, found his body Monday near Sirka, Bihar, three days after he was abducted.
He was the third Catholic clergyman killed in two years in Bihar, where caste-based gang was have killed hundred of people.
Father Thomas, an Indian, had established 15 schools and health projects for untouchables.
But there are no laws against landing them and there is a black market.
In the past, aquariums have come asking too. A Japanese aquarium came looking a few years ago, handing out free synthetic lines, which the fisherman around here most appreciated. The New York Aquarium wanted one too.
But in both cases, they met with strong opposition from coelacanth experts and backed off. Many of the experts believe that if one aquarium manages to capture and show off "old four legs," as the fish is affectionately called, others will want one too and the rush to collect the fish might lead to its extinction.
"Even though we believe we could quite easily do it, create a great sen-

sation, and make a lot of money, we are not doing it," said Michael N. Bruton, the director of the Educational Trust at the Two Oceans Aquarium in Cape Town and a leading authority on the fish. "In fact we are campaigning against anyone doing it."

Mr. Bruton supports another idea: putting cameras in the deep sea grottos where coelacanth rest during the day and satelliting the images around the world to aquariums, so that those who were interested could watch the fish's balletic movements. Scientists who have observed the fish from a miniature submarine have found that it actually does not use its leglike fins, but sometimes performs headstands and swims upside down as it lolls along the ocean floor.

Mr. Bruton says such a project would cost about $400,000. This would include creating an information center on this island, so that Comorans, too, might learn to appreciate the coelacanth. But raising money for the project has proved difficult. "People love the hot and furries," Mr. Bruton said. "But they don't like conserving the wet and slimies. Anyone who has tried to raise money for frog or snake or eel conservation, or fish conservation, or insect conservation has a heck of a job, compared to the fabulous fur balls."

In the meantime, the fisherman of the Comoros ply their trade much as they have for decades, paddling dugout canoes into the temperamental seas around these islands. Depending on the time of year, they venture into deeper waters for large fish or stay close to the clefts, snagging an assortment of fish the size of a child's hand.

Recently, Ishmael Yousouff was shivering in the twilight, his tiny haul at his feet. Mr. Yousouff is a creative fisherman for these parts, leaning over the side of his canoe and using a scuba mask to watch his prey. He is

also a cook, but, he said, the French owner of the restaurant where he worked closed up shop and left the country last year without paying him a month's wages.
Mr. Yousouff shrugs off all the interest in the coelacanth, saying he is more concerned with the lack of jobs on the island and the continuing political turmoil.
"For us it is just a fish," Mr. Yousouff said. "It may be interesting for scientists, but not for us."
"You think this is very beautiful," he said, sweeping his arm across the black rocks, the white beaches and the aqua sea. "But for us it is quite ordinary. I would like to see New York."
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Welchmen Catch
Fish With Legs
LONDON, June 23 (AP)
Two Welsh fishermen
have caught a 20-pound
fish with two short legs
and tiny webbed feet.
The fish was four feet
long, the legs 8 inches
long and extending from

its hind fins. Trevor and
David Jones hooked it
last night from a row boat
in Cardigan Bay. No one
there had ever seen any-
thing like it, and Govern-
ment Fisheries Office of-
ficals are going to Aber-
soch to examine it.
The fish was dark
brown with front fins re-
sembling a skate's, a flat
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like half-moons, a tall and
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